CLAIMS

What is claimed is:

5   1.   A method of screening a library of materials for viscosity, the method comprising:

          providing a library of materials in a plurality of wells defined on a common substrate;

          contacting members of said library with at least one capillary for

10   permitting said materials to be passed through a tip portion of said capillary;

          applying a first force to said materials;

          montoring the relative flow resistance of said materials in response to said force, while said materials remain on said substrate and without the need to remove said materials from said substrate ; and

15   ranking members of said library of materials based on the monitored flow resistance.

          2.   The method of claim 1, further comprising heating said liquids in said library.

20

          3.   The method of claim 1, further comprising applying a second force to said library of materials during monitoring.

          4.   The method of claim 1, wherein said array of materials includes

25   a plurality liquid phase materials.

          5.   The method of claim 4, wherein said liquid phase materials are in a media selected from solutions, emulsions, dispersions or a mixture thereof.

30

          6.   The method of claim 4, wherein said materials are polymers.

7.   The method of claim 1, wherein said library is disposed on a plural well microtiter plate and said measuring is done with each materials entirely within its respective well of said microtiter plate.

8.   The method of claim 1, wherein said array includes at least 4 different liquid materials.

9.   The method of claim 1, wherein said array includes at least 16 different liquid materials.

10.   A method for measuring the viscosity of a plurality of liquid samples, said method comprising the steps of:

providing a library comprising at least four different liquid samples, and serially measuring the viscosity of each of said samples at a throughput rate no greater than about 10 minutes per sample.

11.   The method of claim 10 wherein said liquid samples are selected from the group consisting of polymer solutions, polymer emulsions and polymer dispersions.

12.   The method of claim 10 wherein said liquid samples are members of a combinatorial library of polymerization product mixtures.

13.   The method of claim 10 wherein said liquid samples include at least 8 different samples.

14.   The method of claim 10 wherein said liquid samples include at least 16 different liquid samples.

15.   The method of claim 10 said polymer samples include at least 96 different liquid samples.

16.   The method of claim 10 wherein said viscosity is measured at an average sample-throughput of not more than about 8 minutes per sample.

17.   The method of claim 10 wherein said viscosity is measured at
5   an average sample-throughput of not more than about 5 minutes per sample.

18.   The method of claim 10 wherein said viscosity is measured at an average sample-throughput of not more than about 2 minutes per sample.

10   19.   The method of claim 10 wherein said viscosity is measured at an average sample-throughput of not more than about 60 seconds per sample.

20.   The method of claim 10 wherein said viscosity is measured at
15   an average sample-throughput of not more than about 30 seconds per sample.

21.   The method of claim 10 wherein said viscosity is measured at an average sample-throughput of not more than about 10 seconds per
20   sample.

22.   The method of claim 10 wherein said liquid sample comprises a solid component having a particle diameter ranging from about 1 nm to about 500 nm.
25

23.   The method of claim 10 wherein said liquid sample comprises a solid component having a particle size ranging from about 5 nm to about 300 nm in diameter.

30   24.   The method of claim 10, wherein each said sample is no greater than about 10 ml.

25.   The method of claim 10, wherein each said sample is no greater than about 2 ml.

26.   The method of claim 1 wherein said library comprises at least
eight samples and at least about 50% of the samples included in the library are different from each other.

27.   The method of claim 1 wherein said library comprises at least 16 samples and at least 75% of said samples included in said library are different from each other.

28.   The method of claim 1 wherein said library comprises at least 48 samples and at least 90% of said samples included in the library are different from each other.

29.   The method of claim 1 wherein said samples are polymerization product mixtures resulting from polymerization reactions that are varied with respect to a factor affecting polymerization.

30.   A method of screening a library of materials for viscosity, the method comprising:
        providing a library of at least 16 materials in a plurality of wells defined on a common substrate wherein at least one or more walls define a perimeter of the plurality of wells and wherein each of said plurality of wells has a diameter no larger than about 10 mm;
        contacting the at least 16 materials of said library with at least one capillary in a rapid serial manner for permitting said at least 16 materials to be passed through a substantially cylindrical opening extending through one or more tip portions of the at least one capillary wherein the one or more tip portions are contacted with the at least 16 materials by positioning the one or more tip portions within the plurality of wells such that an outer wall of the one

or more tip portions is in substantially mating relationship with the at least one or more walls that define the perimeter of the plurality of wells;

applying a first force to the at least 16 materials that causes the at least 16 materials to flow through the one or more tip portions of the at least one

5   capillary tube;

measuring the relative flow resistances of the at least 16 materials in response to the force, while the at least 16 materials remain on the substrate and without the need to remove the at least 16 materials from the substrate wherein the relative flow resistances are measured at a throughput rate of no

10   greater than 4 minutes per sample; and

ranking each of the at least 16 materials relative to each other based on the measured flow resistance.

15